EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BOEHRINGER INGELHEIM INTERNATIONAL GMBH and BOEHRINGER INGELHEIM PHARMACEUTICALS, INC., Plaintiffs,	)	C.A. No. 05-700 (***)
v.	)	
BARR LABORATORIES, INC. Defendant.	)	

EXPERT REPORT OF ERIC V. ANSLYN, Ph.D.

I. Background and Qualifications

1. I am the Norman Hackerman Professor of Chemistry and a University Distinguished Teaching Professor at the University of Texas, Austin.

2. I graduated with a doctorate in chemistry in 1987 (and formally received my Ph.D. in 1988) from the California Institute of Technology. The focus of my Ph.D. studies was organic chemistry.

3. Following completion of my doctorate, I spent two years performing post-doctoral work in the field of bioorganic chemistry at Columbia University.

4. For approximately the last 20 years, the focus of my work has been in the area of bioorganic chemistry, with an emphasis on using synthetic organic compounds to mimic biologically active moieties.

5. I teach the introductory organic chemistry class at the University of Texas, a course I have frequently taught for over 17 years. This course covers topics such as organic structures, nomenclature, chirality, and synthesis of organic compounds, including biologically active molecules. During my career, I have also taught courses in bioorganic chemistry, physical organic chemistry, organometallic chemistry, and supramolecular chemistry.

6. I am a co-author of *Modern Physical Organic Chemistry*, a graduate level textbook that covers, among other topics, organic structures, nomenclature, and chirality. I also am in the process of co-writing an undergraduate level organic chemistry textbook, entitled *Organic Chemistry*, which is scheduled to be published toward the end of 2007.

7. For approximately the last seven years, I have been an Associate Editor of the *Journal of the American Chemical Society*.

8. I am a founding member of the Texas Institute of Drug and Diagnostics Development. The primary goal of this institute is the creation of small molecule therapeutics for targets identified by Texas-based medical schools.

9. I have recently been honored with the Arthur C. Cope Scholar Award from the American Chemical Society, which was established to recognize and encourage excellence in organic chemistry.

10. My curriculum vitae is attached as Exhibit A.

II. Mandate

11. I will testify as an expert in the area of organic chemistry.

12. I have been asked by Barr's counsel to comment on certain aspects of three United States patents – U.S. Patent Nos. 4,731,374 ("the '374 patent"), 4,843,086 ("the '086 patent"), and 4,886,812 ("the '812 patent") – including a discussion of what is disclosed by these patents to the person of ordinary skill in the art, how the claims would be understood by the person of ordinary skill in the art, and the relationship between claims of the '086 patent and the '812 patent. I have also been asked to compare these U.S. patents to two earlier German patent applications, and to evaluate whether certain aspects of the general formula disclosed in the U.S. patents would be understood by a skilled artisan to be disclosed by those German applications. I

have also been asked to comment on certain compounds prepared at Eli Lilly & Company, and to analyze whether they are encompassed by the claims of the '812 patent as understood by a skilled artisan.

III. Definition of One of Ordinary Skill in the Art

13. I have been asked by counsel for Barr to provide opinions about the qualifications of the person of ordinary skill in the art ("skilled artisan") who would have understood and appreciated the disclosure and teachings of the '812 patent as of December 22, 1984, the date German application DE 3447075 ("the '075 German application") was filed.[1] In my opinion, the skilled artisan would have had one of the following: (1) a bachelor's degree with an emphasis on organic chemistry, about two years of experience in that field, and a general understanding of medicinal chemistry or bioorganic chemistry; (2) a bachelor's degree with an emphasis on bioorganic chemistry or medicinal chemistry and about two years of experience in one of those fields; (3) a master's degree with an emphasis on organic chemistry, and a general understanding of medicinal chemistry or bioorganic chemistry; (4) a master's degree with an emphasis on bioorganic chemistry, or medicinal chemistry; or (5) comparable education, training, and/or experience.

IV. Materials Relied Upon

14. In addition to my training and experience, I have relied upon the following materials in forming the opinions set forth herein:

- the '374, '086, and '812 patents;

[1] None of the opinions expressed in this Report would change if December 19, 1985, the filing date of the first U.S. application (the application that led to the '374 patent), were used as the date instead.

- BARR000662-666;
- English translations of the '075 German application (Exhibit 53 in this matter) and DE 3508947 ("the '947 German application") (BARR209351-403);
- Eli Lilly U.S. Application Serial No. 747,748 ("the '748 application") (Exhibit 18 in this matter);
- Exhibits 11, 12, 13, 14, 15, 16, 19, 21, 22, 23, 26, 27, 30, 31, and 32 in this matter; and
- the deposition testimony of Bennett Laguzza, William Turner, Richard Hahn, and Barry Smalstig in this matter.

V. Cases in Last Four Years

15. I have not testified as an expert during the last four years.

VI. Compensation

16. I am being compensated for my time at the rate of $350 per hour. My compensation is in no way dependent on the outcome of this case.

VII. Summary of Opinions

17. As understood by the skilled artisan, the compounds in claims 3-5 and 7-10 of the '812 patent[2] are identical to or completely encompass the compounds used in method claims of the '086 patent.

18. While the specification and claims of the '812 patent define R_1 in General Formula I to optionally contain what I will refer to as a "halogenated phenyl," there is nothing in either of the two German applications that describes either implicitly or explicitly to the skilled

[2] I have been advised by counsel for Barr that the Plaintiffs are suing Barr on claims 3-5 and 7-10 of the '812 patent.

artisan, any starting material, intermediate, or final product in which R_1 contains or optionally contains a halogenated phenyl.

19. Individuals at Eli Lilly & Co. successfully prepared the following three compounds prior to December 22, 1984: 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide; 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide; and 2-methylamino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide. In addition, Eli Lilly & Co. patent applications were filed in at least the United States, the European Patent Office, Australia, and South Africa, that disclose and contain claims that the skilled artisan would understand encompass the three aforementioned compounds, disclose methods of synthesizing them, and specifically describe the biological activity of at least the first two of these compounds.

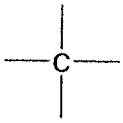
20. In addition to the specific opinions set forth in this Report, I may respond to additional testimony and information that becomes available during deposition, at trial, or otherwise, including any opinions put forth by Boehringer's experts. I may also use charts, graphs, or other demonstrative exhibits to support any potential testimony at trial.

21. I may also provide the Court with general background on relevant principles of organic chemistry.

VIII. General Background

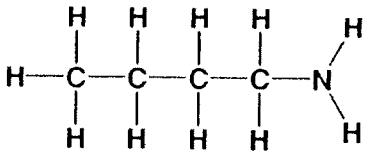
22. In order to provide background for my opinions, it is useful to review a few principles of organic chemistry.

23. Each carbon atom typically forms 4 bonds. Lines are often used to designate bonds between atoms:

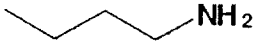


24. When two atoms are bonded to each other with one bond, it is called a "single bond"; when two atoms are bonded to each other with two bonds, it is called a "double bond"; when two atoms are bonded to each other with three bonds, it is called a "triple bond."

25. In drawings of organic compounds, carbon (C) atoms, hydrogen (H) atoms bonded to carbon atoms, and bonds between carbon and hydrogen atoms are often assumed and therefore not specified. Atoms other than carbon or hydrogen, as well as carbon-carbon bonds and bonds between carbon and atoms other than hydrogen, are usually specified. For example:

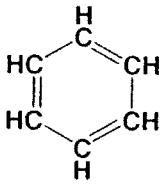


is the same as

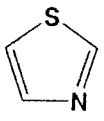


26. Carbon atoms can be arranged in rings. One example of this is benzene:

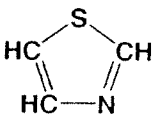
or



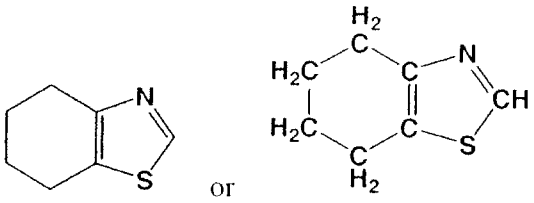
27. Atoms other than carbon can also bond with carbon to form a ring. One class of such ring structures is a group known as heterocycles. One example of a heterocycle is a thiazole ring, which is a five-membered ring with 1 sulfur (S) atom and 1 nitrogen (N) atom positioned in the ring as follows:



or

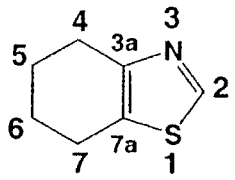


28. The following structure is a tetrahydrobenzothiazole[3]:



The name derives from the fact that the structure has a thiazole ring fused to a benzene ring in which four of the carbon atoms have been substituted with four extra hydrogen atoms.

29. There is a conventional numbering system for the tetrahydrobenzothiazole skeleton that assigns numbers to the atoms in the rings. This allows the skilled artisan to identify the placement of other atoms or groups (often referred to as "substituents") bonded to the ring system. That numbering convention is as follows:



30. An "amino group" generally refers to a substituent that, among other things, contains at least one nitrogen atom with only single bonds to that nitrogen.

31. The compounds disclosed in the '374, '086, and '812 patents are based on a general chemical structure which has two amino groups, shown in grey, bound to a tetrahydrobenzothiazole core:

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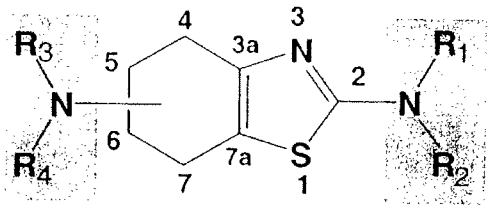
[3] The skilled artisan would understand that the terms "tetrahydrobenzothiazole," "tetrahydrobenzthiazole," and "tetrahydro-benzthiazole" are interchangeable.

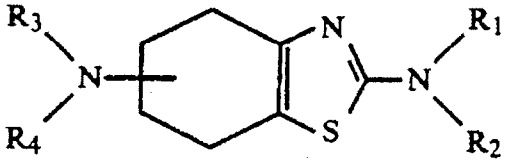


As shown in this drawing, one of these amino groups is in the 2-position of the tetrahydrobenzothiazole core. The other amino group must be placed in either the 4, 5, 6, or 7 positions.

32. As shown in the above drawing, both of the amino groups have two substituents. The substituents attached to the 2-position amino group are designated as R_1 and R_2, and the substituents attached to the other amino group are designated as R_3 and R_4.

IX. Background Information Regarding the '374, '086, and '812 Patents

33. The '374, '086, and '812 patents disclose compounds of the following general formula, which is referred to as General Formula I in their specifications:



> R_1 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group each having 3 to 6 carbon atoms, an alkanoyl group having 1 to 6 carbon atoms, a phenyl alkyl or phenyl alkanoyl group having 1 to 3 carbon atoms in the alkyl part, whilst the above mentioned phenyl nuclei may be substituted by 1 or 2 halogen atoms,
>
> R_2 represents a hydrogen atom or an alkyl group with 1 to 4 carbon atoms,
>
> R_3 represents a hydrogen atom, an alkyl group with 1 to 7 carbon atoms, a cycloalkyl group having 3 to 7 carbon atoms, an alkenyl or alkynyl group having 3 to 6 carbon atoms, an alkanoyl group having 1 to 7 carbon atoms, a phenyl alkyl or phenyl alkanoyl

> group having 1 to 3 carbon atoms in the alkyl part, whilst the phenyl nucleus may be substituted by fluorine, chlorine or bromine atoms,
>
> R_4 represents a hydrogen atom, an alkyl group with 1 to 4 carbon atoms, an alkenyl or alkynyl group having 3 to 6 carbon atoms or
>
> R_3 and R_4 together with the nitrogen atom between them represent a pyrrolidino, piperidino, hexamethyleneimino or morpholino group.

Exhibit 1, Col. 1; Exhibit 2, Col. 1; Exhibit 3, Col. 1.

34. The three patents further identify that the compounds of General Formula I can be used to lower blood pressure, lower heart rate, treat Parkinsonism or Parkinson's disease, or treat schizophrenia. *See, for example*, '812 patent (Exhibit 3), Cols. 7, 10.

35. With regard to the claims of these patents, the skilled artisan would understand that the '374 patent contains compound and method of treatment claims, as well as one pharmaceutical composition claim, the '086 patent contains method of treatment claims, and the '812 patent contains compound claims as well as one pharmaceutical composition claim.

36. The skilled artisan would understand that the '086 patent contains claims to methods of using compounds for lowering blood pressure, lowering the heart rate, treatment of Parkinsonism or Parkinson's disease, or treatment of schizophrenia. The skilled artisan also would understand that the '086 patent has claims to methods of treating each of these disorders by administering a therapeutically effective amount of a compound identified in the particular claim. The skilled artisan would appreciate that, in order to perform the method of treatment in these claims, one would be required to have the specified compound or compounds.

X. Relationship Between Claims of the '086 and '812 Patents

37. The skilled artisan would understand that the compounds in claims of the '812 patent are identical to or completely encompass the compounds used in method claims in the

'086 patent.[4] The following chart shows which claims of the '086 patent: (1) use compound(s) that are identical to the compound(s) in the specified claim of the '812 patent; or (2) use compound(s) that are encompassed within a group of compounds in the specified claim of the '812 patent:

'812 Patent Claim	**'086 Patent Claims**
3	7, 8, 9, 10, 17, 18, 19, 20, 23, 27, 28, 29, 30, 37, 38, 39, 40
4	7, 8, 9, 10, 17, 18, 19, 20, 27, 28, 29, 30, 37, 38, 39, 40
5	9, 10, 19, 20, 29, 30, 39, 40
7	9, 19, 29, 39
9[5]	8, 9, 18, 19, 28, 29, 38, 39
10	8, 9, 18, 19, 28, 29, 38, 39

38. In addition, the skilled artisan would understand that claim 3 of the '812 patent is to a group of compounds that is identical to the group of compounds used in claims 3, 13, and

[4] I understand that there is a disagreement among the parties as to whether the phrase "2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzothiazole" as used in the claims of the patents is limited to the racemic mixture. However, the opinions expressed in this section of my Report are not dependent upon the outcome of that dispute.

[5] I have been advised that Boehringer contends that claims 9 and 10 encompass a dihydrochloride form of the compounds claimed in those claims – *i.e.*, a pharmaceutically acceptable acid addition salt form thereof.

33 of the '086 patent, except that the '086 patent claims also permit R_3 and R_4 together with the nitrogen atom between them to form a pyrrolidino group.

39. The skilled artisan would understand that claim 8 of the '812 patent is to pharmaceutical compositions and is dependent upon claim 3 of the '812 patent. The skilled artisan would further understand that the compounds of the pharmaceutical compositions encompassed by claim 8 of the '812 patent are identical to, or completely encompass, the compounds used in the methods of claims 7, 8, 9, 10, 17, 18, 19, 20, 23, 27, 28, 29, 30, 37, 38, 39, and 40 of the '086 patent.

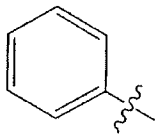
XI. Disclosure of Halogenated Phenyl Groups

40. As discussed above, the definition of R_1 in the '812 patent specification is as follows:

> R_1 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group each having 3 to 6 carbon atoms, an alkanoyl group having 1 to 6 carbon atoms, a phenyl alkyl or phenyl alkanoyl group having 1 to 3 carbon atoms in the alkyl part, *whilst the above mentioned phenyl nuclei may be substituted by 1 or 2 halogen atoms.*

Exhibit 3, Col. 1 (emphasis supplied).

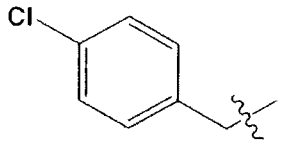
41. A "phenyl group" (or "phenyl nuclei" as used in the '812 patent) can be depicted as follows:



The squiggly line means that the ring acts as a group that can be attached to another atom.

42. A compound where a phenyl group is substituted by one or more halogen atoms can be referred to as a "halogenated phenyl," "halogenated phenyl group," or "halogenated phenyl moiety."

43. An example of a substituent at the R_1 position containing a halogenated phenyl group is 4-chloro-benzyl, which can be depicted as follows:



44. In addition to the above-referenced definition of R_1 for General Formula I, there are several references in the '812 patent to compounds where the R_1 substituent contains within it a halogenated phenyl group:

- the specification states that examples of $-NR_1R_2$ include 2-chloro-benzylamino, 4-chloro-benzylamino, 2-fluoro-benzylamino, and 3,4-dichloro-benzylamino, each of which contains a halogenated phenyl group at R_1, *see* Exhibit 3, Col. 2;

- the specification of the '812 patent further states that particularly preferred compounds of General Formula I include those in which R_1 is 2-chloro-benzyl, 4-chloro-benzyl, or 3,4-dichloro-benzyl, each of which contains a halogenated phenyl group, *see* Exhibit 3 at Col. 3;

- example 10 of the '812 patent contains examples in which R_1 is a 2-chloro-benzyl, 4-chloro-benzyl, or a 3,4-dichloro-benzyl – *i.e.*, where R_1 contains a halogenated phenyl moiety, *see* Exhibit 3 at Cols. 19-20;

- claim 1 of the '812 patent states that R_1 can be "a phenyl alkyl or phenyl alkanoyl group having 1 to 3 carbon atoms in the alkyl part, wherein the above mentioned phenyl nuclei

may be substituted by 1 or 2 halogen atoms" and claim 2 also includes that description, *see* Exhibit 3 at Col. 23-24;

- claim 3 of the '812 patent states that R_1 can be a 2-chloro-benzyl, 4-chloro-benzyl, or a 3,4-dichloro-benzyl, each of which contains a halogenated phenyl group, and claim 4 also includes that description, *see* Exhibit 3 at Cols. 24-25; and
- claim 8 of the '812 patent is to pharmaceutical compositions of compounds of claim 3, and therefore, as referenced above, those compositions include compounds where R_1 contains a halogenated phenyl group, *see* Exhibit 3 at Cols. 24-26.

45. The definition of R_1 in General Formula I of the '812 patent, however, is broader than the definition of R_1 set forth in the '075 and '947 German applications. General Formula I of the '075 and '947 German applications reads:

> R_1 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group each having 3 to 6 carbon atoms, an alkanoyl group having 1 to 6 carbon atoms, a phenyl alkyl or phenyl alkanoyl group having 1 to 3 carbon atoms in the alkyl part.

Exhibit 53 at BARR028270-271. The skilled artisan would not understand this definition to encompass an R_1 substituent containing a halogenated phenyl group, unlike the definition for General Formula I in the '812 patent, which expressly includes such a group.

46. In addition, there is nothing in either of the German applications that discloses implicitly or explicitly to the skilled artisan, any starting material, intermediate, or final product in which R_1 contains or optionally contains a halogenated phenyl group. Unlike the '812 patent, there are no examples in either of the German applications of compounds that contain a halogenated phenyl group as part of the R_1 substituent.

47. As stated above, the skilled artisan would understand that claims 1-4 and 8 of the '812 patent include compounds in which R_1 contains a halogenated phenyl moiety.

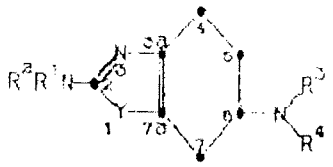
XII. Eli Lilly

48. I have reviewed documents from Eli Lilly & Co. related to the synthesis and biological evaluation of tetrahydrobenzothiazoles, as well as testimony from individuals at Eli Lilly about those experiments. Based on that review, it is my opinion that the following compounds were synthesized at Eli Lilly prior to December 22, 1984: (1) 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide, (2) 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide, and (3) 2-methylamino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide.

49. These materials also reflect that 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide and 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide were evaluated in biological experiments and shown to be active.

50. Following preparation and biological testing of these compounds, the Eli Lilly '748 application was filed, listing Bennett Laguzza and William Turner as inventors. This application discloses the following group of compounds, described as General Formula XX:[6]

[6] For clarity purposes, I have used the picture for General Formula XX from Exhibit 22, but the formula is the same one disclosed in the '748 application.



XX

Wherein Y is S or O, R^1 and R^2 are independently H, methyl, ethyl or n-propyl, and R^3 and R^4 are independently H, methyl, ethyl, n-propyl or allyl; and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acids.

Exhibit 18 at BARR027393-394. The application also states that, for General Formula XX, "Compounds wherein Y is S are substituted 4,5,6,7-tetrahydrobenzothiazoles . . . ." Exhibit 18 at BARR027393-394.

51. The skilled artisan would understand that the three compounds discussed in paragraph 48 above (2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide, 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide, and 2-methylamino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide) are all disclosed by the '748 application:

- The skilled artisan would understand that General Formula XX of the '748 application encompasses each of these three compounds;
- The skilled artisan would understand that 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide is disclosed in Example 1 of the '748 application, and

the description of the synthetic process, including the yields, reflects the process described in Bennett Laguzza's laboratory notebook (Exhibit 11);[7]

- The skilled artisan would understand that 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide is disclosed in Example 2 of the '748 application, and the description of the synthetic process, including the yields, reflects the process described in William Turner's laboratory notebook (Exhibit 30);

- The skilled artisan would understand that claims 1-6 and 9-10 of the '748 application include 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide;

- The skilled artisan would understand that claims 1-5, 9, and 11 of the '748 application include 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide; and

- The skilled artisan would understand that claims 1-2, 4-5, and 9 of the '748 application include 2-methylamino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide.

52. In addition, the skilled artisan would understand claims 1-4 of the '812 patent to encompass 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide and 2-methylamino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide. Similarly, the skilled artisan would understand claims 1-6 of the '812 patent to encompass 2-amino-6-dimethylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide. Because the skilled artisan

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[7] While the examples and claims of the '748 application refer to "5,6,7,8-tetrahydrobenzothiazoles," the skilled artisan would understand from, for example, the remainder of the specification and the synthetic methods described that this was a typographical error, and that the compounds are in fact "4,5,6,7-tetrahydrobenzothiazoles."

would understand that claim 8 of the '812 patent relies on claim 3 of the '812 patent, the skilled artisan would further understand that each of these three compounds falls within the group of compounds of the pharmaceutical compositions encompassed by claim 8.

53. The person of ordinary skill would understand that there is overlap between the compounds in the claims of the '748 application and the compounds in the claims of the '812 patent. The skilled artisan would also understand that there is overlap between the therapeutic uses identified in the '748 application and the therapeutic uses identified in the '812 patent.

54. I have reviewed BARR000662-666, which I have been informed contains the originally filed claims of the application that became the '812 patent. The skilled artisan would understand that there is overlap between the compounds in these originally filed claims and the claims of the '748 application.

55. The skilled artisan would understand that claims 1-4 and 8 in BARR000662-666 include compounds in which R_1 contains a halogenated phenyl moiety.

56. I have reviewed Exhibits 21, 22, and 23, which I understand to be Eli Lilly applications filed in South Africa, the European Patent Office, and Australia. These applications include the same General Formula XX and preparative examples for the same compounds as the '748 application.

57. I have also reviewed Exhibit 26, a Chemical Abstract from April 27, 1987. This abstract, number 131726w, discloses, among other things, the same groups of compounds as General Formula XX and 2-amino-6-di-n-propylamino-4,5,6,7-tetrahydrobenzothiazole dihydrobromide.

3/28/07
Date

Eric V. Anslyn, Ph.D.

EXHIBIT A

Eric V. Anslyn

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Education:

Postdoctoral Work: [12/87-9/89]
Columbia University, New York, New York
Research Advisor: Professor Ronald Breslow
Research: Mechanistic studies of Ribonuclease A mimics. Detailed kinetics analyses of imidazole catalyzed 3'-5' UpU hydrolysis and isomerization. Synthesis and kinetics studies of bis-imidazole β-cyclodextrin catalyzed phosphodiester hydrolyses.

Ph.D., Chemistry: [11/87]
California Institute of Technology, Pasadena, California
Research Advisor: Professor Robert Grubbs
Research: Mechanistic and theoretical studies of olefin metathesis and ring opening metathesis polymerizations catalyzed by group IV and VI metals.

B.S., Chemistry: [5/82]
California State University, Northridge; GPA= 3.97/4.00
Research Advisor: Professor Edward Rosenberg
Research: Mechanistic studies of ligand fluxuations on clusters.

Awards, Honors, and Fellowships:

American Associate for Advancement of Science, Election as a Fellow, 2006
Hamilton Textbook Award, from the University Coop. 2006
Cope Scholar Award. To be granted from the ACS in Spring of 2006.
Named the Norman Hackerman Professor of Chemistry: 2004-Present
Graduate Teaching Award, UT Austin: 2003
Election to Academy of Distinguished Teachers, UT Austin: 2000
Outstanding Faculty Award, UT Continuing Education: 1999
Jean Holloway Award for Excellence in Teaching: 1999
College of Natural Sciences Teaching Excellence Award: 1995
Dreyfus Teacher-Scholar Award: 1994-1996
Alfred P. Sloan Research Fellow: 1994-1996
Proctor and Gamble University Research Initiative: 1993-1996
Searle Scholar: 1991-1994
Presidential Young Investigator: 1990-1995
Camille and Henry Dreyfus Young Faculty Award: 1989
National Science Foundation Post-Doctoral Fellowship: 1988
Union Carbide Fellow in Catalysis: Academic Year 86-87
Graduated with B.S. Summa Cum Laude: 1982
Analytical Chemistry Award, C.S.U., Northridge: 1980

Employment:

University Distinguished Teaching Professor, University of Texas at Austin, 2000-present, teaching and independent research.
Professor, University of Texas at Austin, 1999-2000
Associate Professor, University of Texas at Austin, 1995-1999
Assistant Professor, University of Texas at Austin, 1989-1995
Head of Synthetic Organic NMR Facility: Cal. Instit. of Tech. 1984-1987
Responsible for all training, maintenance and special experiment design on a JEOL FX-90 and JEOL GX-400. Extensive experience with 2D NMR, polarization transfer, magnitization transfer and NMR of heavy metals.

Teaching Assistant, Cal. State Univ. Northridge, 1983
Introductory Chemistry Laboratory, both first and second semester.

University of Texas Departmental and University Service:

Hamilton Book Award Committee, 2006
Dean's Committee for Analysis the Space for ESB, 2006
Upon invitation, Voltaire's Coffee Discussion Group, "The Mists of Avalon" 2006
Participant, Academy of Distinguished Teachers Reading Roundup Discussion, "The Mists of Avalon", 2003, 2004, 2005, 2006.
Academy of Distinguished Teachers Sub-Committee on "Special Courses", 2005
Departmental Awards Committee, 2004-present.
Instructor, Texas Teachers as Scholars, Course on Enzymes, Receptors, and Sensing, Spring 2005.
College of Natural Sciences Tenure and Promotion Committee, 2004-present
Departmental Tenure and Promotion Committee, 2004-Present
SPAC Committee Member, 2003-present
Assistant Graduate Student Advisor 1995-present.
Chairman, Graduate Student Recruiting Committee for the Chemistry and Biochemistry Department, 1995-1999.
Chairman, Department of Chemistry Safety Committee, 1993-1999.
College of Natural Sciences Safety Committee, 1995-1999.
Undergraduate Chemistry Student Advising, 1990-1995.
Chairman: Organic Chemistry Seminar Series from 1992-1995.
Lecture to the ACS Student Affiliates, Spring 1999.
Lecture to the ACS Student Affiliates, Fall 1998.
Lecture to the ACS Student Affiliates, Fall 1996.
Lecture to the 1994 Honors Colloquium.
Lecture to The Young Chemists Society, 1993.
Departmental Fellowship Committee, 1992-1995.
Graduate Student Recruitment Committee, 1991.

Professional Service:

Organizer, Supramolecular Chemistry Conference, Hawaii, 2008.
Pacific Chem. Symposium Co-Organizer, Dec. 2005.
Pacific Chem. Symposium Co-Organizer, Dec. 2000.
J. Am. Chem. Soc., Manuscript Associate Editor, Oct. 1st 1999 - present.
NIH Medicinal Chemistry A, Study Section Member, 1999-2003.
Supramolecular Chemistry, Editorial Advisory Board, 1999-2004.
J. Supramolecular Chemistry, Editorial Advisory Board, 1999-present.
J. Am. Chem. Soc. Book and Software Associate Editor, 1998-Oct. 1st 1999.
Symposium Co-Organizer: Southwest Regional ACS Meeting 1993.
23rd Macrocycle Conference Co-Organizer: Oahu Hawaii 1998.
1999 NSF Workshop on Physical Organic Chemistry, Co-organizer.
1998 NSF Workshop on Physical Organic Chemistry, Co-organizer.
1997 NSF Workshop on Physical Organic Chemistry, Co-organizer.
Reviewer of Batelle National Laboratory project on Anion Recognition.
Ad Hoc Member, Bioorganic and Natural Products Study Section, NIH, 1996.
Ad Hoc Member, Medicinal Chemistry A, Study Section, NIH, 1997.

Patents:

1. "A Receptor and Method for Citrate Determination, The University of Texas at Austin," Patent filed Oct. 15th 1998, First Office Action Dec. 7th 1998. Axel Metzger, Eric V. Anslyn. Issued.

2. "Detection System Based on An Analyte Reactive Particle," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, University of Texas at Austin, United States Patent application (09/616,355), PCT application (PCT/US00/19302), filed 7/14/00. Issued 9/5/2003, #6,602,702.

3. "General Signaling Protocols For Chemical Receptors In Immobilized Matrices," John T. McDevitt, Eric. V. Anslyn, Jason B. Shear, Dean P. Neikirk, United States Patentapplication, PCT application (PCT/US00/19351) filed 7/14/00. Issued. #6,589,779.

4. "Fluid-Based Analysis of Mulitple Analytes by a Sensor Array," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. B. Neikirk, United States application (09/287,248), filed 4/7/99.

5. "Method and System for In Vivo Measurement of Multiple Analytes by a Sensor Array," J. McDevitt, E. Anslyn, J. Shear, D. Neikirk, J. Scott, M. O'Hare, M. Otworth, J. Douglas, J. McMorris, United States application, filed 5/8/00.

6. "Sensor Arrays for the Measurement and Identification of Multiple Analytes in Solution," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, United States Patent application (09/354,882), PCT application (PCT/US99/16162) filed 7/16/99. Australian application (53165/99) filed 1/10/01; Canadian application filed 1/15/01; European application (99938752.5), filed 1/16/01.

7. "Method and Apparatus for the Delivery of Samples to a Chemical Sensor Array," J. T. McDevitt, E. V.Anslyn, J. B. Shear, D. P. Neikirk, D. Borich, United States Patent application (09/616,731), PCT application (PCT/US00/19351), Taiwanese application (89114103), Philippine application (1-2000-001896), filed 7/14/00.

8. "Magnetic-Based Placement and Retention of Sensor Elements in an 'Electronic Tongue' Sensor Array," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, United States Patent application (09/775,342), filed 1/31/01.

9. "Method and System for Collecting and Transmitting Chemical Information," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, United States Patent application (09/775,340), PCT application (PCT/US01/03141), filed 1/31/01.

10. "System and Method for the Analysis of Bodily Fluids," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P.Neikirk, United States Patent application (09/775,344), PCT application (PCT/US01/03139), filed 1/31/01.

11. "Method of Preparing a Sensor Array," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, United States Patent application (09/775,353), PCT application (PCT/US01/03241), filed 1/31/01.

12. "System for Transferring Fluid Samples Through a Sensor Array," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, Y.-S. Sohn, United States Patent application (09/775,048), PCT application (PCT/US01/03316), filed 1/31/01.

13. "Portable Sensor Array System," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, United States Patent application (09/775,343), PCT application (PCT/US01/03240), filed 1/31/01.

14. "Method and Apparatus for the Confinement of Materials in a Micromachined Chemical Sensor Array," J. T. McDevitt, E. V. Anslyn, J. B. Shear, D. P. Neikirk, provisional United States Patent application 60/265,776). filed 1/31/01.

15. "Multimodal Miniature Microscope" M. Descour, R. Dupuis, E. Anslyn, R. Richard-Kortum, Provisional United States Patent application, filed 09/07/01.

Research Publications:

152) "Micromachined microfluidic chemiluminescent system for explosives detection," Y. S. Park, H. S. Hewage, D. P. Neikirk, E. V. Anslyn, SPIE Defense and Security Symposium **2007**, Conference 6554, *Chemical and Biological Sensing VIII*, April 11-12, 2007, paper [6554-02].

151) "Smart microplates: integrated photodiodes for detecting bead-based chemiluminescent reactions," Yoon S. Park, Matthew M. Andringa, Dean P. Neikirk, Himali S. Hewage, and Eric V. Anslyn, 5th IEEE International Conference on Sensors, paper # B1L-E-4, Daegu, Korea, October 22 - 25, 2006.

150) "Differential Receptor Arrays and Assays for Solution-Based Molecular Recognition," Aaron T. Wright; Eric V. Anslyn, *Chem. Soc. Rev.*, **2006**, 35, 14-28.

149) "A Colorimetric Boronic Acid Based Sensing Ensemble for Carboxy and Phospho Sugars," Tianzhi Zhang; Eric V. Anslyn, *Org. Lett*, **2006** 8(8), 1649 -1652.

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145) "Micromachined chemiluminescent system for explosives detection," Yoon Park, Dean P. Neikirk, and Eric V. Anslyn, in *Proceedings of SPIE*,Volume 6398 Optically Based Biological and Chemical Detection for Defence III, John C. Carrano, Arturas Zukauskas, Eds., 63980R (Oct. 13, 2006)

144) "Indicator-displacement assays" Binh T. Nguyen, Eric V. Anslyn, *Coor. Chem. Rev.* **2006**, *250*, 3118-3127.

143) "A Structural Investigation of the N-B Interaction in an o-(N,N-Dialkylaminomethyl)arylboronate System" Zhu, Lei; Shabbir, Shagufta H.; Gray, Mark; Lynch, Vincent M.; Sorey, Steven; Anslyn, Eric V *J. Am. Chem. Soc.* **2006**, *128*, 1222-1232.

142) "Signal amplification by allosteric catalysis" Zhu, Lei; Anslyn, Eric V*Angew. Chem., Int. Ed,* **2006**, *45*, 1190-1196.

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140) "Modern Physical Organic Chemistry", a textbook, Eric Anslyn and Dennis Dougherty, University Science Books, 2005.

139) "A Functional Assay for Herapin in Serum Using a Designed Synthetic Receptor, "Aaron T. Wright; Zhenlin Zhong; Eric V. Anslyn, *Angew. Chem.* **2005,** 44(35), 5679-5682.

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137) "Differential Receptors Create Patterns That Distinguish Various Proteins" Aaron Wright, M. Griffin, Z. Zhong, S.McCleskey, E.V. Anslyn, J.T. McDevitt, *Angew. Chem.* **2005**, *117*, 6533-6536.

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135) "Preparation of 1,3,5-Tris(aminomethyl)-2,4,6-triethylbenzene from Two Versatile 1,3,5-Tri(halosubstituted) 2,4,6-Triethylbenzene Derivatives" Karl Wallace, Robert Hanes, Eric Anslyn, Jeroni Morey, Kathleen Kilway, Jay Siegel, *Synthesis*, **2005**, *12*, 2080-2083.

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133) "An Artificial Siderophore for the Detection of Iron(III)" K. J. Wallace, M.Gray, Z. Zhong, V. Lynch, E.V. Anslyn, *Dalton Trans.* **2005**, *14*, 2436-2441.

132) "Naked-Eye Detection of Histidine by Regulation of Cu(II) Coordination Modes" J. Frantz Folmer-Andersen, Vince Lynch, E.V. Anslyn, Chem. Eur. J. **2005**,*11*, 0000.

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J. Am. Chem. Soc., **2005**, *127*, 7987-7988.

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129) Abiotic Guanidinium Receptors for Anion Molecular Recognition and Sensing, R.J.T. Houk, S.L. Tobey, E.V. Anslyn, Topics Curr. Chem. **2005**, Springer-Verlag, Vol. 255, p 199.

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127) "Thermodynamic Analysis of Receptors Based on Guanidinium/Boronic Acid Groups for the Complexation of Carboxylates, a-Hydroxycarboxylates, and Diols: Driving Force for Binding and Cooperativity" Wiskur, S.L.; Lavigne, J.J.; Metzger, A.; Tobey, S.L.; Lynch, V.; Anslyn, E.V. *Chem. Eur. J.* **2004**, *10*, 3792-3804.

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123) "Catalytic Signal Amplification Using a Heck Reaction. An Example in the Fluorescence Sensing of Cu(II)" Wu, Qiaoyin ; Anslyn, Eric V.
J. Am. Chem. Soc. **2004**, *126*, 14682-14683.

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Organic Letters **2004** *6*, 2499-2501.

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Invited Lectures:

166) "The Power of Differential Receptors Rather Than Selective Receptors" University of Basel, Oct. 30th 2006
165) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match" University of Berne, Oct. 31st, 2006
164) "Supramolecular Analytical Chemistry" University of Neuchatel, Nov. 1st, 2006.
163) "Combining Supramolecular Chemistry with Chemometrics" University of Fribourg, Nov. 2nd 2006.
162) "Teaching Supramolecular Chemistry New Tricks" University of Lausanne, EPFL, Nov. 3rd 2006
161) "A Marriage of Supramolecular Chemistry with Pattern Recognition" ACS Meeting, Fall 2006, San Francisco, Cope Scholar Award Presentation
160) "Practical Sensing Applications" Merck Pharmaceuticals, August 17th, 2006. Rahway NJ
159) "A Marriage of Supramolecular Chemistry with Pattern Recognition" June 26th, 2nd ISMSC, Victoria Canada.
158) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", June 16th. 2006, Oviedo Universitad. Oviedo, Spain.
157) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", June 14th, 2006 Autonomica Quimica. Madrid, Spain.
156) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", June 12th, 2006, Institute Catala d'Investigacio Quimica, Tarragona, Spain..
155) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match" June 9th, 2006, Valencia Universitad, Valencia Spain.
154) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", June 7th, 2006, Universitad de Illes Balears, Mallorca Spain.
153) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Apr.. 13th 2006, Northeastern Univ. Boston, MA.
152) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Mar. 10th 2006, Iowa State Univ., Ames, IO.

151) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Feb. 9th 2006, Univ. Arizona, Tuscon, AZ.
150) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Jan. 12th 2006, Univ. Tennessee, Knoxville TN.
149) "A Marriage of Supramolecular Chemistry and Pattern Recognition", Jan. 9th 2006, Structural and Functional Organic Chemistry GRC, Santa Ynez CA.
148) "Physical Organic Chemistry of Molecular Recognition Processes", Dec. 18th, Pacific Chem, Honolulu , HI.
147) "A Marriage of Supramolecular Chemistry and Pattern Recognition", Dec. 17th, Pacific Chem, Honolulu , HI.
146) "Structural and Functional Assays for Boronic Acids", Dec. 15th, Pacific Chem, Honolulu , HI.
145) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match, Nov. 14th, Univ. of Toledo, Toledo Ohio.
144) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Oct. 10th, Wuhan University, Wuhan, China.
143) "Supramolecular Chemistry and Pattern Recognition: A Complementary Match", Sept. 15th, Washington University, St. Louis MO.
142) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" June 16th, University of Turku, Finland.
141) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" June 13th, Symposium on Synthetic Receptors, Lund Sweden.
140) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" May 28th, Merck Pharmaceuticals, Rahway NJ.
139) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" April 15th, University of Zurich.
138) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" April 14th, University of Geneva.
137) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" April 12th, Swiss School on Supramolecular Chemistry.
136) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" March 9th, Univ. Mass. Amherst.
135) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" March 88th 2005, Brown University.
134) "Organic Chemistry Approaches to Single and Multi Analyte Sensing" Nov. 17th, Cal. State Univ. Northridge.
133) "A Marriage of Supramolecular Chemistry and Pattern Recognition" Nov. 4th, Brauman-Bell Lecture, Baylor College of Dentistry, Dallas TX.
132) "A Marriage of Supramolecular Chemistry and Pattern Recognition" Oct. 8th, Marquette University.
131) "A Marriage of Supramolecular Chemistry and Pattern Recognition" Sept. 8th 2004, SCT meeting, Prague, Czech Rep..
130) "A Marriage of Supramolecular Chemistry and Pattern Recognition" July 27th, XII ISSC, Notre Dame University.
129) "Organic and Organometallic Approaches to Molecular Sensing" July 12th, University of Bristol, England.
128) "Organic and Organometallic Approaches to Molecular Sensing" July. 8nd, Bioanalytical Gordon Conference, Queen's College Oxford England.
127) "Organic and Organometallic Approaches to Molecular Sensing" July. 5th, Organic Mechanisms Conference, University College Dublin Ireland.
126) "Organic and Organometallic Approaches to Molecular Sensing" July. 2nd, Trinity College Dublin Ireland.
125) "Organic and Organometallic Approaches to Molecular Sensing" July. 1st, Queen's College Belfast Ireland.
124) "Organic and Organometallic Approaches to Molecular Sensing" June. 14th, Bioorganic Gordon Conference, Protor Academy.
123) "Organic and Organometallic Approaches to Molecular Sensing" June. 1st, London Ontario Canada, Canadian Chemical Society Meeting.
122) "Organic and Organometallic Approaches to Molecular Sensing" Mar. 31st, Simon Fraser Univ.
121) "Organic and Organometallic Approaches to Molecular Sensing" Mar. 30th, Univ. British Columbia.
120) "Organic and Organometallic Approaches to Molecular Sensing" Mar. 29th, Univ. of Victoria.
119) "Organic and Organometallic Approaches to Molecular Sensing" Mar. 28th, Anaheim ACS meeting.
118) "Organic and Organometallic Approaches to Molecular Sensing" Mar. 19th, University of Houston.
117) "Organic and Organometallic Approaches to Molecular Sensing" Jan. 27th, Laval University.
116) "RNA Hydrolysis and Catalysis of Cleavage" Jan. 26th, Laval University.
115) "Uses of Indicator-Displacement Assays". Jan. 15th, 2004, Sundial Beach Resort, NSF Young Supramolecular Chemist Conferece.
114) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Dec. 8th, U.C.S.D.

113) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Nov. 3rd, Halliburton Corporation.
112) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" University of Montana, Oct. 20th
111) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Oct. 17th, Montana State University
110) "Organic Chemistry Approaches to Molecular Sensing", Sept. 18th, Georgia Tech.
109) "Organic Chemistry Approaches to Molecular Sensing" Sept. 8th, NYC ACS Meeting Symposium on Supramolecular Chemistry.
108) "Organic Chemistry Approaches to Molecular Sensing" April 28th, Astra Zeneca.
107) "Organic Chemistry Approaches to Molecular Sensing" April 28th, U. Alberta.
106) "The Power of Supramolecular Chemistry in Sensing" Jan. 30th, New Mexico State Univ.
105) "Organic Structures for Chemical Sensing" Dec. 4th, Texas Tech University
104) "Artificial Phosphodiesterases", Dec. 3rd, Texas Tech University
103) "Organic Structures for Chemical Sensing" Sept. 23rd, University of Pennsylvania.
102) "Organic Structures for Chemical Sensing" Sept. 6th UT Arlington 2002 Boston ACS Meeting.
101) "Organic Structures for Chemical Sensing" Aug. 18th 2002 Boston ACS Meeting.
100) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" May 23rd, 2002 North Dakota State University
99) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" April 11th, 2002 Notre Dame University.
98) "The Impact of Array Sensors on Supramolecular Chemistry" Symposium Honoring Roger Tsien, ACS Meeting, April 9th, 2002. Orlando Fl.
97) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Jan. 24th, 2002 Clemson University.
96) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Dec. 7th, 2001 University of Reno.
95) "Organic Chemistry Approaches to Single and Multi-Analyte Sensing" Nov. 8th, 2001 University of Utah.
94) "Organic Approaches to Sensor Development" NATO Conference on Sensing, Prague, Czech Rep. Sept 1st 2001.
93) "Anion Receptors", Chicago ACS meeting, Anion recognition symposium, Aug. 27th 2001.
92) "Organic Chemistry Approaches to Single and Multi Analyte Sensing", LSU, May 4th, 2001.
91) "Organic Chemistry Approaches to Single and Multi Analyte Sensing", Pharmacopeia, Mar. 22nd, 2001.
90) "Sensing in the Anslyn Group", Breslow Birthday Symposium, Mar. 23rd, New York.
89) "Application of Nano Technology to Diagnostics", AADR Conference, Chicago, Mar. 9th 2001.
88) "Organic Chemistry Approaches to Single and Multi Analyte Sensing", Colorado St. Univ., Jan. 23rd, 2001.
87) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Pacific Chem, Honolulu Hawaii, Dec, 12th 2000
86) "Differential vs Selective Sensing, a Furtile Ground for Combinatorial Chemistry", Conference on Combinatorial Chemistry in Molecular Recognition, Saarbrucken Germany, Dec. 9th 2000.
85) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Rochester University, Sept. 30th 2000
84) "Single and Multi Analyte Sensing", ISSC 2000, Aug. 2nd, Fukuoka Japan
83) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Rochester University, Sept. 29th 2000.
82) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", UT Southwestern Medical School
81) "Designed and Combinatorial Receptors", University of Pavia, Italy, April 18th, 2000.
80) "Designed and Combinatorial Receptors", University of Parma, Italy, April 17th, 2000.
79) "The Mammalian Sense of Taste, and Mimics Thereof" Germany Agricultural Society Conference, April 13th, 2000, Cologne.
78) "Designed and Combinatorial Receptors", University of Bonn, Germany, April 10th, 2000.
77) "Designed and Combinatorial Receptors", University of Munich, Germany, April 14th, 2000.
76) "Mimicking the Mammalian Sense of Taste", Spring ACS Meeting, San Francisco, ACS Symposium on Taste and Smell.
75) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Penn. State University, Mar. 13th, 2000.
74) "Designed and Combinatorial Receptors", Gordon Research Conference on Sensors, Jan. 25th 2000, Ventura Ca.
73) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", University of North Carolina, Chapel Hill, Dec. 2nd 1999
72) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", North Carolina State University, Dec. 1st 1999
71) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Arizona State University, Feb. 3rd 2000.
70) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", University Miss. St. Louis, Nov. 8th 1999.
69) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Washington University, Nov. 8th 1999.
68) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Texas A&M University, Sept. 10th 1999.
67) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", University of Texas at Austin, Oct. 14th 1999.

66) "Organic Chemistry Approaches to Single Analyte and Multianalyte Sensing", Carnegie Mellon University, Apr. 19th, 1999.
65) "Organic Approaches to Single Analyte and Multianalyte Sensing," University of Missouri, Kansas City, Feb. 24th, 1999
64) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors put to a Practical Use," ISPE Conference, Jan. 26th 1999
63) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors Put to a Practical Use," Virginia Commonwealth University, Nov. 10th, 1998
62) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors put to a Practical Use," University of Delaware, Oct. 27th, 1998
61) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors put to a Practical Use," Montana State University, Oct. 19th, 1998
60) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors put to a Practical Use", University of Montana, Oct. 16th, 1998
59) "From Single Analyte to Multi-Analyte Sensing Methodologies, Synthetic Receptors put to a Practical Use", NSF Workshop on Physical Organic Chemistry, June 1998
58) "The Site of Cleavage of Pyranosides, and New Sensing Methodologies" Wichita State University. Feb. 4th 1997.
57) "Supramolecular Catalysis: Reaction Mechanisms," Fifth Chemical Congress of North America, Cancun Mexico, Nov. 1997.
56) "Physical Organic Chemistry of Catalysis and Sensing," Scripps Institute for Chemical Sciences, La Jolla, CA, Oct. 24th 1997
55) "Sensor Based upon Synthetic Receptors," NSF Workshop on Physical Organic Chemistry, June 1997, Gold Lake Colorado
54) "Artificial Receptors as Catalysis and Sensors," Procter and Gamble Corp. May 1997
53) "Catalysts, Sensors, Mechanistic Probes: Molecular Recognition in Action.," University of Oita, Oita Japan, Jan. 1997
52) "Catalysts, Sensors, Mechanistic Probes: Molecular Recognition in Zction.," University of Kyushu, Kyushu Japan, 1997
51) "Catalysts, Sensors, Mechanistic Probes: Molecular Recognition in Action.," Kurume Research Center, Kurume Japan, Jan. 1997
50) "Catalysts, Sensors, Mechanistic Probes: Molecular Recognition in Action.," University of Hiroshima, Hiroshima Japan, Jan. 1997
49) "Catalysts, Sensors, Mechanistic Probes: Molecular Recognition in Action.," Ministry of Science and Education, Tsukuba Japan, Jan. 1997
48) "Enzymatic and Solution Acetal Hydrolysis Mechanisms," NSF Workshop, Squam Lake, NH. July 1996.
47) "Supramolecular Catalysis of Phosphoryl and Glycosyl Transfers," University of Arkansas, Fayetteville, Ark. Jan. 15th 1996
46) "Guanidinium Catalyzed Phosphoryl Transfers," Pacific Chemistry Conference, Dec. Honolulu, HA. 18th 1995.
45) "Methods in Combinatorial Libraries of RNA and Oligomeric Guanidiniums," Southwest Regional ACS Meeting Memphis Nov. 1995.
44) "Methods in Combinatorial Libraries of RNA and Oligomeric Guanidiniums," Proctor and Gamble Corp. Cincinnati OH Sept. 25th 1995.
43) "Endocyclic vs. Exocyclic Cleavage of Pyranosides," NATO Conference on Bioorganic Chemistry, Johnstown, PA. May 18th 1995.
42) "Catalysis of Glycosyl and Phosphoryl Transfers," Purdue University, May 1st 1995.
41) "A Phosphorane pK_a Determined via Pulse Radiolysis," ACS Meeting, Anaheim CA, April 1995.
40) "Mechanistic Aspects of Supramolecular Catalysis," Syracuse University, Syracuse, NY, Jan. 24th 1995.
39) "Mechanistic Aspects of Supramolecular Catalysis," Clinical Diagnostic Systems Incorporated, Rochester N.Y. Jan. 26th 1995.
38) "Mechanistic Aspects of Supramolecular Catalysis," Rochester University, Rochester, NY, Jan. 27th 1995.
37) "Mechanistic Aspects of Supramolecular Catalysis," McGill University, Montreal, Quebec, Canada, Oct. 4th 1994.
36) "Mechanistic Aspects of Supramolecular Catalysis," University of Montreal, Montreal, Quebec, Canada, Oct. 5th 1994.
35) "Mechanistic Aspects of Supramolecular Catalysis," Sherbrooke University, Sherbrooke, Quebec, Canada, Oct. 3rd 1994.
34) "Mechanistic Aspects of Supramolecular Catalysis," Eli Lilly Corp. Indianapolis, IN, June 30th 1994.
33) "Mechanistic Aspects of Supramolecular Catalysis," University of Wisconsin, Madison, May 19th 1994.
32) "Artificial Restriction Endonucleases," Searle Scholars Conference, Chicago, May 16th 1994.
31) "Mechanistic Aspects of Supramolecular Catalysis," Massachusetts Institute of Technology, Boston MA. May 9th 1994.
30) "Mechanistic Aspects of Supramolecular Catalysis," Polaroid Corporation, Boston MA. May 6th 1994.
29) "Mechanistic Aspects of Supramolecular Catalysis," University ofIllinois, Urbana-Champagne, IL. May 4th 1994.

28) "Mechanistic Aspects of Supramolecular Catalysis," University of Pennsylvania, Philadelphia Penn. May 2nd 1994.
27) "Mechanistic Aspects of Supramolecular Catalysis" Smith-Kline, Beecham, Philadelphia Penn. April 29th 1994.
26) "Mechanistic Aspects of Supramolecular Catalysis Stanford University," Palo Alto, CA. April 20th 1994.
25) MARION MERRILL DOW LECTURE, "Mechanistic Aspects of Supramolecular Catalysis"," University of California , Berkeley CA. April 19th 1994.
24) "Mechanistic Aspects of Supramolecular Catalysis," University of California, Los Angeles CA. April 14th 1994.
23) "Mechanistic Aspects of Supramolecular Catalysis," California Institute of Technology, Pasadena CA. April 13th 1994.
22) "Mechanistic Aspects of Supramolecular Catalysis," Texas A & M University, Dec. 9th 1993.
21) "Mechanistic Aspects of Supramolecular Catalysis," Alcon Corp. Dec. 8th, 1993.
20) "Organic Catalysts for RNA Hydrolysis," Genta Incorporation, San Diego, CA August 10th 1993.
19) "Catalysis of Phosphodiester Hydrolysis by Bis-GuanidiniumReceptors," XVIII International Symposium on Macrocyclic Chemistry, Univerisity of Twente, Netherlands, July 1993.
18) "Polyazaclefts for Molecular Recognition and Catalysis," Strasbourg University, France, July 1993.
17) "Polyazaclefts for Molecular Recognition and Catalysis," University of Munich, July 1993.
16) "Phosphodiester Hydrolysis Catalysts," 76th Canadian ChemicalConference, Sherbrooke, Quebec, June 1993.
15) "Physical Organic Studies of Biological Relevance," NSF Reactive Intermediates Conference, Lake Tahoe, June 1993.
14) "Polyaza Clefts for Molecular Recognition and Catalysis," New York University, March 5th 1993.
13) "Phosphodiester Hydrolysis Catalysts," ICI Pharmaceuticals, March 8th 1993.
12) "Polyaza Clefts for Molecular Recognition and Catalysis," SUNY Stoney Brook, March 4th 1993.
11) "Polyaza Clefts for Molecular Recognition and Catalysis,"Columbia University, March 3rd 1993.
10) "Molecular Recognition of Carbohydrates, Enolates, and Phosphodiesters," U.T. Arlington, Nov. 1992.
9) "Molecular Recognition of Carbohydrates, Enolates, and Phosphodiesters," Carnegie Mellon University, Nov. 1992.
8) "Complexation of Reactive Intermediates," XVII International Symposium Macrocyclic Chemistry, Provo, UT August 1992.
7) "Molecular Recognition of Carbohydrates, Enolates, and Phosphodiester," Hiroshima University, July 1992.
6) "Molecular Recognition of Carbohydrates, Enolates, and Phosphodiesters", Tokyo Institute of Technology, July 1992.
5) "General Acid Catalysts for Phosphodiester Cleavage", XIII International Symposium of Molecular Recognition and Inclusion, July 26th 1992, Kyoto Japan.
4) "Phosphodiester Receptors for a Variety of Solvents," Short Talk, Biooorganic Gordon Conference, Plymouth State College, June 1992.
3) "Polyaza Clefts for Molecular Recognition Purposes," University of Houston, April 3rd 1992.
2) "Synthesis of Polyazaclefts for Bioorganic Studies," Princeton University, April 26th 1991.
1) "Ribonuclease A Mimics," The University of Texas at Dallas, Nov. 31st 1990.

Research Support:

PAST SUPPORT

1. National Science Foundation, High Risk Research Program, "Mixed Valent Molecular Ferromagnets," 1990-1991, $50,000.
2. National Science Foundation, Post-Doctoral Research Supplement, "Carbohydrate Complexing Agents," 1989-1990, $32,000.
3. Texas Advanced Technology Program "Degradation of Aromatic Pollutants by an Artificial Oxidase," 1989-1991, $105,000.
4. Texas Advanced Technology Program "Molecular Recognition Driven Co-Facial Assembly of Metallomacrocycles," 1989-1991, $125,000.
5. The Robert A. Welch Foundation (F-1151) "Selective and Asymmetric Catalytic Olefin Hydrogenation," June 1st 1989-May 31st 1992; $75,000.
6. Searle Foundation "Artificial Restriction Endonucleases," March 1st 1991-Feb. 28th 1994 $162,000. One year extension granted.
7. Camille and Henry Dreyfus Foundation (NF-89-35) "Bioorganic Catalyst Development," Sept. 1st 1989-Aug. 31 1994, $25,000.
8. Monsanto Corporation "Research Support Donation as Part of Presidential Young Investigator Program," $10,000 1990.
9. Texas Advanced Technology Program, "Rationally Designed Degradation Enzymes for Aromatic Pollutants", 1992-1994, $160,409 (Co-PI with Jon Robertus).
10. North Atlantic Treaty Organization "Receptors for Co-Factor Hydrolysis," 1993-1994. $12,000 (Co-PI with Franz Schmitdchen in Munich, Germany).

11. National Science Foundation, Presidential Young Investigator Award (CHE-9057208) "Development of Artificial Enzymes," Nov. 1st 1990-Oct. 31st 1995, $125,000 (base), $375,000 (with matching funds).
12. National Institutes of Health "Carbohydrate Artificial Receptors and Mechanistic Probes," 1994-1997, $270,000.
13. National Instituties of Health "Artificial Metallonucleases,"1994-1997, $270,000
14. Texas Advanced Technology, "On-Line Sensors for the Analysis of Common Beverage Additives," 1998-2000, $150,000.
15. National Institutes of Health "The Development of an Electronic Tongue," (E. Anslyn, PI: total for four groups) 1998-2001, $783,008.
16. National Science Foundation – NER Program "Molecular Duplex Formation," (M. Krische P.I., total for two groups), 2002-2004, $100,000.
17. Army Research Office, MURI, "Texas Consortium for the Development of Biological Sensors," $2,999,000 (A. Ellington, PI; total for 10 groups) 05/01/1999-04/30/2004.
18. Beckman Foundation Technologies Initiative "Center for the Design and Fabrication of Sensor Arrays," $2,500,000 (J. Shear, PI; total for 8 groups) 7/99 - 6/04.
19. National Science Foundation "Artificial Metalloenzymes for RNA Hydrolysis," $310,000, 9/01/00-8/30/03.
20. Department of Defense "Anion Receptors and Selectors," PI with Co-PI Jonathan Sessler, $350,000, 2000-2003.
21. National Science Foundation, "Multi-Modal Miniature Microscopes," Rebecca Richard-Kortum, PI, with three Co-PIs, 303,000, 2000-2003.
22. National Institutes of Health "Further Development of the UT Electronic Tongue," (E. Anslyn, PI: total for four groups) 2002-2006, $900,000.
23. National Institutes of Health "Model Studies of Low Barrier Hydrogen Bonds in Catalysis," 2002-2006, $750,000.
24. National Institutes of Health "Micro-Array Analysis of Saliva," (PI with 7 other co-PI's), 2002-2006, $4,000,000.
25. National Institutes of Health "The Molecular Recognition of Urine" 2005-2006, $100,000.

CURRENT SUPPORT

Welch Foundation "Characterizing Phosphoranes with Pulse Radiolysis," 2003-2006, $96,000.
National Institutes of Health "Colorimetric Methods for the Determination of Enantiomeric Excess" $876,000 direct, 2006-2010.
National Science Foundation "Enantiomeric Excess Assays for Carboxylic Acids" $346,000 direct for 2006 – 2009.